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ECONOMIC CHANGE IN THE GRANDE CACHE REGION OF ALBERTA

by

© T. Peter Adams

A THESIS

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The undersigned certify that they have read and recommend to the Faculty of Graduate Studies for acceptance a thesis entitled "Economic Change in the Grande Cache Region of Alberta," submitted by T. Peter Adams in partial fulfilment of the requirements for the degree of Master of Science.

ABSTRACT

The Grande Cache Region of Alberta is about to undergo economic change following commercial development of the Smoky River Coal Fields. This thesis is an enquiry into some of the implications industrial development will have for the indigenous population.

Prospects for continued regional economic development are bright because the resource potential of the area is quite good, particularly with respect to coal and recreation and tourism. To date the Metis inhabitants of the region have been living in a state of isolated poverty, earning a living in unskilled and seasonal vocations. Following economic change they may experience improved job opportunities within the occupational divisions in which they are presently employed. However, due to low levels of formal education, non-technical work experience, and an aged indigenous labour force, the local people will have little opportunity to improve their present income and employment status. Industrial development will create many new jobs, most of which require high levels of professional and technical competence and thus will be filled from exogenous sources. Consequently, the indigenous Metis population is in a position to benefit very little from regional economic development.

ACKNOWLEDGEMENTS

A study of this nature could not have been undertaken without the assistance and encouragement provided by my supervisor, Dr. W.B. Rogers. His decision to allow me the opportunity to use my personal initiative in the development of this thesis has been greatly appreciated. In addition, the comments and suggestions of Dr. W.E. Phillips, Dr. B. Proudfoot, and Mr. L. Hetland have been extremely helpful.

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CHAPTER I

INTRODUCTION

Preamble

For the past 50 years the Grande Cache Region of Alberta has been populated by people of Indian ancestry whose migration to the area was necessitated by the loss of their former place of residence following the establishment of Jasper National Park in 1910.[1] Approximately 25 Metis families now live in poverty and geographic isolation in the three settlements of Muskeg, Susa Creek and Grande Cache. To date they have earned a living in such seasonal vocations as guiding, hunting, trapping, fishing, and manual labour employment.

The decision by the provincial government to allow the development of natural resources within the region will force many social changes upon the indigenous population. Consequently, the University of Alberta has initiated a regional study divided into two parts:

(1) An analysis of the changes of the family as a social institution.

(2) An analysis of the resource potential of the area, present income status of the native population, and employment opportunities of the indigenous labour force.

This thesis will consider the second aspect of the situation.

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[1] For a more complete discussion of the history of the Grande Cache population refer to James G. MacGregor, Pack Saddles to Tete Jaune Cache (Toronto: McClelland and Stewart Ltd., 1962).

The Region

Development of the reserves of the Smoky River Coal Fields is currently underway[1] and prospects for continued economic development[2] of the area are good. The reserves, located in Census Division 14 and approximately 80 miles northwest of the town of Hinton, are in the immediate vicinity of the three Metis settlements (Appendix 1, Figures 1 and 2).

The Grande Cache Region, for the purpose of this study, is defined as the geographical area extending about 28 miles from the three Metis settlements on the east to the Smoky River Coal Fields on the west. The Grande Prairie and Edson Forests limit the region on the north, while Willmore Wilderness Park, located approximately 20 miles south, provides the southern regional boundary (Appendix 1, Figures 1 and 2).

The delineated region is small relative to the total area in which natural resource development could significantly affect the indigenous population of the region. Therefore, Chapter II has been devoted to a discussion of the natural resource potential and geographical characteristics of the Grande Cache Region and surrounding areas.

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[1] McIntyre Porcupine Mines Ltd. has established a mine within the area and will commence exporting coal to Japan in 1970. By 1972 Canadian Utilities Ltd. will have constructed a coal-fired electric power plant at the mine site. In addition, a new town is being created to serve these industries and surrounding areas.

[2] Economic development is defined by the author as an increase in regional Gross Domestic Product.

Objectives

Economic change is being introduced into the Grande Cache Region of Alberta. Consequently, economic development will occur. In light of these developments, the objectives of this thesis can be stated as follows:

(1) To determine the natural resource potential of the area and the direction in which economic development can be expected to take in the future.

(2) To determine the present income status of the native population and hence extent of poverty within the region.

(3) To determine the opportunity levels possessed by members of the indigenous labour force to improve their present income and employment status following economic change.

Plan of Study

The natural resource potential and geographical characteristics of the area are discussed in depth in Chapter II. Information was obtained from literary sources, the Canada Land Inventory and from various personnel within the provincial government and other qualified agencies such as the Research Council of Alberta.

Chapter III consists of a presentation of primary data on the human resources of the region obtained in April and May of 1969 through personal interviews with the head of each household. Whenever the head of the household was unavailable, the spouse was assumed to be a valid alternative. Because some of the native people spoke relatively little English, interviews were conducted by English speaking enumerators with the aide of native interpreters who spoke Cree fluently.

Consultation with ARDA officials in Census Division 14 prior to the survey indicated that there are numerous Metis families living within the communities of Entrance and Brule, located approximately 16 and 25

miles west of Hinton, respectively. However, upon completion of the survey it was discovered that both communities have populations which are primarily Caucasian. The decision was then made to use both Entrance and Brule as a basis for comparative analysis to see whether or not individuals living in the same geographical area, but having a different ethnic background, have the same income status and employment opportunities as the Metis population. Whenever possible, comparisons were also made with C. D. 14 and Alberta figures.

Reference to the elegible voters list for the 1968 federal election indicated that the communities of Grande Cache,[1] Entrance, and Brule each contain less than 25 elegible voters. Due to the small numbers involved, an attempt was made to survey the total population of all three communities. However, the elegible voters list was found to be incomplete and the native interpreters were then used to find the additional persons who had failed to register for the last federal election.

Fifteen families were contacted at Entrance, while 17 interviews were made at Brule. In both cases all the responses were acceptable and included in the analysis. A total of 29 families were found at Grande Cache. However, five of the families were Caucasian rather than Metis. This category included the local store owner, school teacher and forest ranger, who have appreciably higher levels of formal education, incomes, and standards of living than the native people. Therefore, because the five Caucasian families totalling 12 persons are not part of the problem entertained in this study, they were omitted from the results obtained.

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[1] Henceforth the settlements of Grande Cache, Susa Creek, and Muskeg will be referred to as the community of Grande Cache.

The literature of economic base theory and migration rates has been reviewed in order to study the principal concepts of regional income and employment. This review provides the theoretical framework by which the size of the regional labour force and employment available to the native population was determined.

Employment opportunities that can be expected by the indigenous labour force following economic change within the region were then estimated. Estimates were derived by using the theoretical framework development in Chapter IV, the results of the survey of the human resources of the region outlined in Chapter III, and employment information obtained from officials of McIntyre Porcupine Mines Ltd. and Canadian Utilities Ltd.

Finally, all results are summarized and conclusions drawn with respect to the resource potential of the area, present income, status of the native population, and employment opportunities of the indigenous labour force. Information obtained from both component parts of the regional study will then be put at the disposal of policy makers for their consideration.

CHAPTER II

NATURAL RESOURCES OF THE AREA

To determine the potential for future economic development of the Grande Cache Region and surrounding area, the natural resources have been surveyed and catalogued under the headings of Forestry; Water; Recreation and Tourism; Oil, Natural Gas, and Sulphur; Other Minerals; and Coal.

Based upon the Canada Land Inventory[1] present land use classification,[2] land in the Grande Cache Region is essentially forested with a high proportion of productive woodland.[3] Consequently the area is suited to the production of pulpwood and other forestry products. However, there is

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[1] The Canada Land Inventory is a comprehensive survey of land capability and use for various purposes. It will include assessments of land capability for agriculture, forestry, recreation and wildlife; information on present land use; and assessments of social and economic factors relative to land use. It is being undertaken as a cooperative federal-provincial program administered under the Agricultural Rehabilitation and Development Act (ARDA) of June, 1961. Canada, Department of Forestry, ARDA, The Canada Land Inventory, Report No. 1 (Ottawa: Queen's Printer, January 1965), p. 3.

[2] Canada, Department of Forestry and Rural Development, ARDA, The Canada Land Inventory Present Land Use Maps - 83 E 8,9,14,15,16 and 83 F 5, 12 (Ottawa: Department of Forestry and Rural Development), preliminary.

[3] "Productive woodland, as defined by the Canada Land Inventory, includes land having trees which are over 20 feet in height and which have a canopy cover occupying more than 30 percent of the area. Artificially restocked and planted areas are included regardless of age." Canada, Department of Forestry and Rural Development, ARDA, The Canada Land Inventory Legends (Ottawa: Department of Forestry and Rural Development), preliminary.

some non-productive woodland,[1] part of which is cut-over or land that has been harvested for pulpwood, particularly around the towns of Entrance and Brule.[2]

The region is a foothills area characterized by very rolling topography with the Rocky Mountains situated to the west and southwest. There are some muskeg patches, lakes, and streams in the low-lying areas with increasing amounts of exposed rock surfaces toward the mountains. In general, land available for agriculture is extremely limited because of forest reserves, poor soil, and adverse climatic conditions.

Forestry Resources

Heavy stands of forest resources are characteristic of the area surrounding the new town of Grande Cache. To the south lies Willmore Wilderness Park, an area of approximately 1,700 square miles with abundant tree stands. However, the Park which was created in 1959 by the Alberta government to preserve its wilderness value, is not available for commercial exploitation at the present time.[3]

The Edson Forest of 9,420 square miles lies south and east of the new town, and the latest inventory figures available indicate there are approximately 37,406,071 cords of coniferous pulpwood and 8,219,718

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[1] "Non-productive woodland, as defined by the Canada Land Inventory, includes land bearing tree or brush growth which is under 20 feet in height and which has a canopy cover occupying less than 30 percent of the area. This category consists largely of cut-over or burned-over land which shows no evidence of grazing." Canada, Department of Forestry and Rural Development, ARDA, The Canada Land Inventory Legends (Ottawa: Department of Forestry and Rural Development), preliminary.

[2] The woodland may be non-productive in the short-run only because the degree of tree and brush cover can increase over time.

[3] A.A. Lupton and C.J. McAndrews, A Traverse of Willmore Wilderness Park (Edmonton: ADA, Program Development Division, 1968), p. 2.

cords of aspen pulpwood within this forest. In addition, the area contains 9,069,000 and 2,057,410 M.F.B.M. (thousands of board feet) of coniferous and aspen sawtimber, respectively.[1]

North Western Pulp and Power Ltd. have extensive leases within the Edson Forest and to date have harvested between 374,000 and 395,000 cords of pulpwood per annum. However, in 1968, as a result of an increase in the size of its lease, the company was authorized to approximately double its annual cut to 800,000 cords.[2] This increase, in turn, has necessitated a $250 million expansion of its bleached craft pulp mill in Hinton, which will be started in 1971 and completed by 1973, thereby doubling the present capacity of the mill and employing an additional 500 persons.[3]

North of the new town lies the 14,091 square mile Grande Prairie Forest containing 22,945,000 and 16,530,000 cords of coniferous and aspen pulpwood, respectively. Sawtimber inventory estimates are 10,131,000 coniferous M.F.B.M. and 9,495,000 aspen M.F.B.M.[4]

Presently the Proctor and Gamble Company of Canada Ltd. is conducting feasibility studies within this forest with a view to establishing a pulp mill south of Grande Prairie. Results of the study should be available by the spring of 1970.[5]

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[1] Information obtained from Mr. R. Fitch, Forestry Branch, Alberta Department of Lands and Forests, May, 1969.

[2] Ibid.

[3] "North Western Pulp and Power Ltd. - Outlook Hi-Brite," The Alberta Business Journal, September-October, 1968, pp. 34-35.

[4] Fitch, Op. Cit.

[5] Public information available from the Forestry Branch, Alberta Department of Lands and Forests.

The Whitecourt Forest, northeast of the Smoky River Coal Fields, also has abundant forestry resources which may be commercially exploited in the immediate future. Presently Macmillan Bloedel Ltd. officials are examining the stands of pulpwood within this area to determine the feasibility of a pulp mill at Whitecourt.[1]

In general, the forestry resources of the area surrounding the new town of Grande Cache and the Smoky River Coal Fields are abundant, particularly the coniferous stands, which are well suited for pulp and paper production. One major pulp mill is established within the Edson Forest with plans for expansion. Two additional companies may locate within the Grande Prairie and Whitecourt Forests pending the results of current feasibility studies. Therefore, the vast forest resources of west-central Alberta can readily be subjected to commercial exploitation in the near future. However, such exploitation may have little effect upon the Grande Cache Region itself because of its peripheral position to exploitable forest areas.

Water Resources

The area is part of the Athabasca and Smoky River Basins, both of which form part of the Arctic Water Shed. Both surface water and ground water is common in this general area.[2] In addition, Willmore Wilderness Park "forms the headwaters and one of the major sources of water for the Smoky, Simonette, Little Smoky and Wild Hay-Berland River Systems".[3]

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[1] Public information available from the Forestry Branch, Alberta Department of Lands and Forests.

[2] Provincial Planning Board, Report and Recommendations to the Lieutenant Governor in Council for New Town Status for Grande Cache, Alberta (Edmonton: Provincial Planning Board, August, 1966), p. 5.

[3] Lupton and McAndrews, Op. Cit., p. 5.

The average flow of the Athabasca River at the Hinton pulp mill is 6,560 cubic feet per second, while the average flow of the Smoky River at Watino in C.D. 15 is 13,200 cubic feet per second.[1] However, during the year there is very considerable variation in flow. In 1963-64, mean discharge of the Smoky at Watino was 1,280 cubic feet per second in March compared with 52,700 cubic feet per second in June.[2] Therefore, although the average yearly flow is quite high, the marked seasonal fluctuations pose problems to large water users such as pulp mills. Consequently, it appears that a moderate water supply is characteristic of the area.

Recreation and Tourism

Outdoor Recreation

The Canada Land Inventory Classification of land capability for outdoor recreation indicates that because of the forest vegetation and rolling topography characteristic of the area, there is excellent potential for dispersed recreational land use, but only limited potential for intensive recreational activities.[3] Consequently, relative to the rest

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[1] Jerry F. Bigam, Industry and Resources in Alberta's Census Division 15, Resource Study 801 (Edmonton: Rural Development Research Branch, Economics Division, Department of Agriculture, 1968), p. 66.

[2] Department of Energy, Mines and Resources, Surface Water Data for Arctic and Western Hudson Bay Drainage and Mississippi Drainage in Canada, Water Year 1963-64 (Ottawa: Department of Energy, Mines and Resources, 1966), p. 94.

[3] "Intensive activities are those in which relatively large numbers of people may be accommodated per unit area, while dispersed activities are those which normally require a relatively large area per person.

The inventory classification is designed in accordance with present popular preferences in non-urban recreation. Urban areas (generally over 1,000 population with permanent urban character) are not classified. Land is ranked according to its natural capability under existing conditions, whether in natural or modified state; but no assumptions are made concerning its capability given further major artificial modifications." Canada, Department of Forestry and Rural Development, ARDA, The Canada Land Inventory Outdoor Recreation. Maps 83E 8,9,14,15,16 and 83 F5, 12 (Ottawa: Department of Forestry and Rural Development), preliminary.

of the province, the potential is good for such activities as big game hunting, fishing, viewing of upland wildlife, camping, and canoe tripping. In the case of beach activities and other recreation of an intensive nature which support relatively large numbers of people per unit area, prospects are quite limited. However, there are some boating and cottage development possibilities around some of the larger lakes.

Waterfowl

Again using the Canada Land Inventory as a basis for making land use projections, it appears that the waterfowl potential of the Grande Cache Region is quite low relative to the parkland and prairie regions of Alberta. Because of the predominance of forested uplands with some muskeg and low-lying streams, waterfowl are not provided with a sufficient quality and quantity of food, protective cover, and space to meet their needs for survival, growth, and reproduction.[1]

Adverse topography manifested through both steepness and flatness of the land limits the development and permanency of wetlands which are necessary for a satisfactory waterfowl habitat. Frequently these topographic features are such that they adversely affect the width and development of optimum marsh conditions along the edge of water areas. Furthermore, there is a fertility limitation because there are insufficient nutrients in the soil and water for the plant growth necessary for optimum waterfowl production.[2]

The area west of Wabamum also has the disadvantage of being west

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[1] Canada, Department of Forestry and Rural Development, ARDA, The Canada Land Inventory, Waterfowl Maps 83 E 8,9,14,15,16 and 83F 5,12 (Ottawa: Department of Forestry and Rural Development), preliminary.

[2] Ibid.

of the two major Alberta flyways (Pacific and Central) which extend from Wabamum east to the Alberta-Saskatchewan border. Consequently, there is a sprinkling of waterfowl throughout the region, but no large concentrations of birds.[1] Therefore, because of the poor natural habitat resulting in a relatively small number of birds per unit area, only a small number of hunters can be supported in the region.

Sport Fishing

Streams in the vicinity of the Grande Cache Region are moderately productive, and fish numbers are extensive due to the large territory involved. Willmore Wilderness Park in particular has abundant fish supplies. The principal game fish of the area are Mountain Whitefish, Dolly Varden, Arctic Grayling, and Rainbow Trout.[2]

In the past the Entrance Park chain of Cache Lake and Graveyard Lakes has been stocked with Rainbow Trout.[3] Presently the Fish and Wildlife Division is working on a program to eliminate the fish populations of Pierre Grays lakes, Victor and Grande Cache lakes, prior to stocking them with trout. The program is being financed by ARDA funds.[4]

The area is frequented by anglers from as far west as Edmonton, but to date very little advertising has been done to inform the public of

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[1] Telephone interview with Mr. H. Weaver, Wildlife Biologist, Alberta Project Leader for Waterfowl Sector of the Canada Land Inventory, May 13, 1969.

[2] Personal interview with Mr. R. Paterson, Senior Wildlife Biologist, Fish and Wildlife Division, Alberta Department of Lands and Forests, May 7, 1969.

[3] Ibid.

[4] Personal interview with Mr. R. Paterson, Senior Wildlife Biologist, Fish and Wildlife Division, Alberta Department of Lands and Forests, May 7, 1969.

the abundant fish supplies available. It is probable that there exists a potential for accommodating greater numbers of fishermen within the area and for increasing guiding and outfitting opportunities.[1]

Big Game Hunting

The potential for big game hunting in the vicinity of the Grande Cache Region is very good. Relative to the rest of the province the area is characterized by good or excellent supplies of Moose, Mule Deer, Caribou, Sheep, Goats, Elk, and Bear. It is the only portion of Alberta which contains either harvestable Caribou or a relatively large population of Goats. In addition, Willmore Wilderness Park has the added advantage of being a sizeable wilderness area, resulting in secluded and non-competitive hunting. Consequently, in the opinion of one expert, the Park provides the best hunting within the province.[2] This view is believed to be shared by many persons associated with big game hunting in Alberta.

Because the future for big game hunting within the area appears quite bright, the potential for guiding and outfitting should be equally as good. Presently the native people are serving as guides. However, the income generated from the periodic harvesting of surplus wild animals appears to be earned largely by people of European origin who provide the capital and managerial skills needed for the organization of fishing and hunting trips. If the Metis people are able to accept the more demanding managerial aspects of this economic activity, there is no discernable reason why they cannot become integrated into a financially remunerative

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[1] Personal interview with Mr. R. Paterson, Senior Wildlife Biologist, Fish and Wildlife Division, Alberta Department of Lands and Forests, May 7, 1969.

[2] Personal interview with Mr. Gordon Kerr, Chief Wildlife Biologist, Fish and Wildlife Division, Alberta Department of Lands and Forests, May 7, 1969.

occupation for which they have been admirably prepared by their cultural values and traditions.[1]

Oil, Natural Gas, and Sulphur

Although extensive drilling activity has been characteristic of northern and western Alberta since the early 1950's, no major oil or gas fields have been discovered in the immediate vicinity of Hinton, Entrance, Brule, or the new town of Grande Cache.

The closest established gas field is that of Bertrand River, located approximately 45 miles east northeast of the town of Muskeg. This field had an initial potential in 1958 of 440 billion cubic feet when it was brought into production, and as of December 31, 1967, contained 300 billion cubic feet of remaining marketable gas.[2] In addition, at this time the area contained 400 billion cubic feet of remaining recoverable raw sulphur gas with a hydrogen sulphide content of 16.0 percent. In terms of remaining recoverable sulphur, the area contains 2,165 thousand long tons.[3]

The Bigstone gas field, 10 miles northeast of the Bertrand River discovery, initially contained 478 billion cubic feet of gas with 250 billion cubic feet remaining marketable at the end of 1967.[4] The area's

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[1] Lupton and McAndrews, Op. Cit., p. 6-7.

[2] Oil and Gas Conservation Board, Reserves of Crude Oil, Gas, Natural Gas Liquids and Sulphur, Province of Alberta (Calgary: Oil and Gas Conservation Board, December 31, 1967), p. 61.

[3] Ibid., p. 121.

[4] Ibid., p. 61.

sulphur content is 333 billion cubic feet of 19.0 percent raw gas or 2,259 thousand long tons of recoverable sulphur.[1]

The Simonette pool, 45 miles northeast of Muskeg, is the closest oil field to the Grande Cache Region and as of the first of 1968 contained 40,898 million stock tank barrels of remaining recoverable crude oil from an initial potential in 1958 of 87,000 million stock tank barrels.[2]

The Gold Creek field, located 25 miles south of Grande Prairie is of particular interest. Construction will commence this summer on a $7.5 million natural gas processing plant with completion scheduled for early 1970. Planned initial production is 40 million cubic feet of residue gas, 3,600 barrels of condensates, and 105 long tons of sulphur daily. Solid and molten sulphur will be marketed via the New Alberta Resources rail line.[3]

In general, oil and gas fields containing very substantial amounts of crude oil, gas, and sulphur have been discovered to the north and east of the Grande Cache Region. To date no significant discoveries have been made within 40 miles of residences of the people interviewed in this study. Thus the petroleum industry has had relatively little effect upon the indigenous people of the area.

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[1] Oil and Gas Conservation Board, Reserves of Crude Oil, Gas, Natural Gas Liquids and Sulphur, Province of Alberta (Calgary: Oil and Gas Conservation Board, December 31, 1967, p. 121.

[2] Ibid., p. 29.

[3] "Gas, Power Plants Rise With ARR," Within Our Borders, May, 1969, p. 8.

Other Minerals

The area in the vicinity of the Grande Cache Region contains varying amounts of other minerals. However, none are of economic significance at this time.

> A surface deposit of gypsum is located on the Alberta-British Columbia border at Fetherstonhaugh Creek, just above the boundary of Jasper National Park and essentially due west of the new town of Grande Cache. In 1967 a testing program was carried out on this deposit and the results indicated a fairly low gypsum content at around 80 percent or less. With the problems of transportation, access and the low quality of the deposits, no immediate development is in sight. A spur line from the Resources Railway might result in future quarrying of this deposit, if construction is possible over the semi-mountainous terrain.[1]

Another gypsum deposit considered to be pure, but not large in area, is located at Mowitch Creek, about one-half mile inside the northern boundary of Jasper National Park. The deposit is about 200 feet thick, but the exact reserves are unknown. At present, under existing federal regulations, development would not be possible.[2]

Limestone deposits are located near Cadomin, Brule, Roche Miette, and Henry Howe in Jasper National Park. Quarrying operations are currently being carried out at Cadomin, and the limestone is used mainly in the production of cement and cement products and satisfies the local market for these products. Some of the exposures measure 180-250 feet thick. Outcroppings are also located three miles southwest of Brule where thicknesses

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[1] Bigam, Op. Cit., p. 32.

[2] Department of Industry and Tourism, The Feasibility of Developing Alberta Gypsum Deposits (Edmonton: Department of Industry and Tourism, 1968), p. 21.

extend up to 200 feet.[1] However, most of the limestone in the area is remotely located.[2]

Other minerals in the area include Silica Rich Quartzite, which may possibly be economic to mine in the future, but at this time is remote from any source of transportation; Marl, which also is remotely located; little, if any, Iron Ore; Bentonite, the potential supply of which is virtually unknown, but the markets are apparently already satisfied; Pumicite, in unknown quantities; insufficient reserves of Phosphatic Rocks; and Helium in Natural Gas which may become more economic as the technology of extraction methods improves.[3]

Coal

The Smoky River area is characterized by thick seams of high quality coal reserves. By an approximation, this reserve may contain 700 to 800 million tons of Group I coal.[4] Further south in the Sheep Creek area there are additional seams of steam coal.[5] Along the west side of the Smoky River in the Mount Hamell area from Gustaus Flats northeast to

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[1] Victor T. Janssen, Kenneth A. Svenson, and W. Randall Meeks, Resources for Rural Development - Census Division 14 (Edmonton: Rural Development Section, Farm Economics Branch, Alberta Department of Agriculture, 1965), p. 46.

[2] Personal interview with Dr. Green, Chief, Earth Sciences Branch, Research Council of Alberta, May 13, 1969.

[3] Ibid.

[4] Group I coal is low volatile, non-coking coal from mountain areas and commonly called steam coal. It is a good storage, weather resistant coal which burns with a short, slightly smoky flame and is used mainly for generation of steam. When briquetted, it is also used for domestic heating. Alberta Bureau of Statistics, Alberta Industry and Resources - 1968 Edition (Edmonton: Department of Industry and Development, 1968), p. 63.

[5] R.N. Harvey, Land, Industries and Related Factors in the Peace River Country, Alberta (Edmonton: Northern Alberta Development Council, 1968), p. 49.

the point where Sheep Creek joins the Smoky River, excellent exposures are to be found. Numerous coal seams are visible in this section, and also along small tributary creeks of Smoky River.[1]

The area contains very large reserves of Group II[2] coal, which in this case is high grade coking coal, second only in quality in the world to the Appalachian coking coal of West Virginia. As a valuable energy source, it is used in blast furnaces for the manufacture of steel. Demand for this type of coal is quite firm and the supply relatively limited.[3]

It is in this Mount Hamell area that McIntyre Porcupine Mines Ltd. has leased 31,500 acres[4] for coal extraction just northwest of the new town of Grande Cache. Exact estimates as to the amount of coal present in the area are unavailable, but it is known that the reserves are extremely large. McIntyre Porcupine Mines Ltd. indicate that in the order of 540 million tons of coal reserves are available in their lease, 180 million

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[1] Provincial Planning Board, Op. Cit., p. 7.

[2] Group II coal is a high volatile coking bituminous coal from mountain areas, also commonly called steam coal. It is a good storage, weather resistent coal which burns with a medium long, smoky flame and is used for railways and for steam raising in general, and also for making coke, as smitty coal, and in the cement industry. Alberta Bureau of Statistics, Op. Cit., p. 63.

[3] Bigam, Op. Cit., p. 30.

[4] Provincial Planning Board, Op. Cit., p. 7-8.

of which are expected to be economically extractable.[1]

> Much more detailed surface and underface work will be required before accurate estimates can be made. However, MacVicar (1924) quotes the following figures which he regards as conservative:

Smoky River - Sheep Creek Region	
Possible tonnage, semi-anthracite and semi-bituminous	58,500,000
Possible tonnage, bituminous	7,000,000,000
Total	7,058,500,000 tons

> McEnoy (1925) estimated the coal reserve of the National Coal Reserve (540 square miles of the Smoky River - Sheep Creek region) to be 3,424,363,000 tons. This figure was obtained by assuming that 73 feet of coal would be mined to a depth of 2,000 feet below access level.[2]

In short, total coal reserves within the Grande Cache Region and surrounding areas, although as yet unknown, are very large.

However, the main problem is to determine the amount of this coal that has coking qualities. Apparently the coal to be used to fill McIntyre Porcupine's present contract has excellent coking qualities. In other sections of their lease the quality of the coal will be determined only when the results of present investigations by the company are known.[3]

Should current investigations reveal that the area is characterized by a high percentage of Group II coking coal, it is very probable that economic development will be sustained for a long period of time. A large expansion in the rate of coal extraction and exportation would

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[1] Provincial Planning Board, Op. Cit., p. 7-8.

[2] Ibid.

[3] Personal interview with Dr. J. D. Campbell, Research Officer, Coal Research Division, Research Council of Alberta, May 13, 1969.

occur due to the strong world demand for this resource. It follows that a major stimulus would be given to the local economy and the regional Gross Domestic Product would expand accordingly. Consequently, it is quite conceivable that the Grande Cache Region and its indigenous population has only begun to experience economic change.

CHAPTER III

HUMAN RESOURCES OF THE AREA

Industrial development can create many new jobs within a region. However, labour is not a homogeneous resource and the indigenous labour force can realize improved job opportunities only if they possess certain requisite employment characteristics. For reasons which will be discussed in greater depth in the following chapter, the labour force of the Grande Cache Region has been examined with respect to its age, education, and employment history. In addition, the present income status of the Metis population has been determined to ascertain the degree of poverty characteristic of the region.

For comparative purposes, 1961 is the latest year for which statistics are available for Census Division 14 and Alberta. As far as can be determined by the author, no large change in incomes, employment, education levels, or resource development has occurred within the Grande Cache Region during the past eight years. Therefore, the 1961 figures for C.D. 14 and Alberta will serve as a reliable standard for comparison with the results obtained from the survey of the area's human resources.

Age and Education

Total Population

Family heads interviewed were asked to list the age of all family members and the number of years of formal schooling possessed by each. Table I gives a breakdown of the number of individuals within various categories of educational attainment for the population five years of age and over, attending and not attending school. However, the percentage figures of Table 2 are more desirable for purposes of comparison. In both cases the "elementary" category includes all persons attending kindergarten.

"Post-secondary" education includes all persons who have attained some university education or post-secondary education of an equivalent general type.

Approximately 27 percent of the Alberta and C.D. 14 population was attending school in 1961, 25 percent of which were enrolled in secondary or post-secondary education. Eight years later only 20.6 percent of the Grande Cache population are attending school, all of which have not advanced above an elementary level of education.

A majority of persons from Grande Cache not attending school have no formal education (71.6 percent), while essentially all the rest have attained only an elementary level of schooling. Percentages for Alberta, C.D. 14, Entrance, and Brule are much more favourable. In these cases, less than nine percent of the total population five years of age and over have no formal education. Similarly, at least four percent has obtained some post-secondary training.

Therefore, relative to Alberta, C.D. 14, Entrance and Brule, the total population of the Grande Cache Region has an extremely low level of formal educational achievement. Very few of those either attending or not attending school have advanced above an elementary level of education, with a large percentage having no formal schooling at all.

Table 1

POPULATION FIVE YEARS AND OVER, ATTENDING AND NOT ATTENDING SCHOOL BY HIGHEST GRADE ATTENDED[1]

	Alberta[2] 1961	C.D. 14[2] 1961	Grande Cache 1969	Entrance 1969	Brule 1969
Total	1,331,944	19,282	128	53	76
Population 5 years and over	1,152,056	16,324	102	46	74
Attending School					
Total	319,150	4,372	21	14	33
Elementary	240,920	3,501	21	10	19
Secondary	69,208	789	..	4	12
Post-Secondary	9,022	82	..	..	2
Not Attending School					
Total	832,906	11,952	81	32	41
No Schooling	58,434	1,060	58	1	3
Elementary	299,826	5,179	22	14	15
Secondary	418,697	5,210	1	11	21
Post-Secondary	55,949	503	..	6	2

[1] All tables whose source is not otherwise indicated include data based upon the survey of the communities of Grande Cache, Entrance and Brule.

[2] Canada, Dominion Bureau of Statistics, 1961 Census of Canada, Bul. 1.2-10 (Ottawa: Dominion Bureau of Statistics, 1961), p. 23-26.

Table 2

PERCENTAGE OF POPULATION FIVE YEARS AND OVER ATTENDING AND NOT ATTENDING SCHOOL BY HIGHEST GRADE ATTENDED

	Alberta[1] 1961	C.D. 14[1] 1961	Grande Cache 1969	Entrance 1969	Brule 1969
Total Population 5 years and over					
Attending School	27.7	26.8	20.6	30.4	44.6
Total	100.0	100.0	100.0	100.0	100.0
Elementary	75.3	80.1	100.0	71.4	57.6
Secondary	21.9	18.0	0.0	28.6	36.4
Post-secondary	2.8	1.9	0.0	0.0	6.0
Not Attending School	72.3	73.2	79.4	69.6	55.4
Total	100.0	100.0	100.0	100.0	100.0
No Schooling	7.0	8.9	71.6	3.2	7.3
Elementary	36.0	43.3	27.2	43.6	36.6
Secondary	50.3	43.6	1.2	34.5	51.2
Post-secondary	6.7	4.2	0.0	18.7	4.9

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[1] Canada, Dominion Bureau of Statistics, 1961 Census of Canada, Bul. 1.2-10 (Ottawa: Dominion Bureau of Statistics, 1961), p. 23-26.

Labour Force

To determine the formal education characteristic of the labour force of each community surveyed, the population aged 15 years and over was aggregated into four age groupings (Tables 3,4, and 5). Persons aged 14 years and under were excluded because they are presently enrolled in school or are of pre-school age.

The grouping 15-19 years of age was made to encompass those either completing their education or comprising the youngest members of the labour force. Persons in this classification are assumed to be a homogenous group from an employment and educational standpoint with a great deal of potential for occupational training. Those in their early twenties, between the ages of 20 and 24, comprise the next arbitrary grouping which can be assumed to be homogenous. They still possess much of the flexibility characteristic of youth that would enable them to make relatively major occupational adjustments and changes. Persons within the category aged 25-44 will have some potential for retraining and adjustment to alternative employment opportunities. Those aged 45 and over will usually find vocational changes very difficult.

Reported years of formal schooling were analyzed statistically to determine the mean and standard deviation by sex for each age grouping. The extent of illiteracy was ascertained by assuming any person with less than a grade four education to be illiterate.

Table 3

EDUCATIONAL ACHIEVEMENT BY AGE GROUPING - GRANDE CACHE 1969

Age Grouping	Sex	Persons	Years Formal Schooling Average	Years Formal Schooling Standard Deviation	Illiterate Number	Illiterate Percent
15 - 19	M	3	2.7	2.5	2	66.7
	F	4	6.5	1.3		
20 - 24	M	5	3.2	3.3	3	60.0
	F	4	2.5	3.3	3	75.0
25 - 44	M	16	0.3	0.8	16	100.0
	F	17	1.4	2.7	14	82.4
45 +	M	11	0.7	1.7	10	90.9
	F	5	0.0	0.0	5	100.0

Table 4

EDUCATIONAL ACHIEVEMENT BY AGE GROUPING - ENTRANCE 1969

Age Grouping	Sex	Persons	Years Formal Schooling Average	Years Formal Schooling Standard Deviation	Illiterate Number	Illiterate Percent
15 - 19	M	2	9.0	1.4		
	F	2	12.0	0.0		
20 - 24	M	1	10.0	0.0		
	F	4	11.3	2.2		
25 - 44	M	6	9.3	4.2		
	F	2	10.5	2.1		
45 +	M	10	7.3	4.2	2	20.0
	F	8	9.3	4.5	1	12.5

Table 5

EDUCATIONAL ACHIEVEMENT BY AGE GROUPING - BRULE 1969

Age Grouping	Sex	Persons	Years Formal Schooling		Illiterate	
			Average	Standard Deviation	Number	Percent
15 - 19	M	5	9.8	1.3		
	F	9	10.8	1.2		
20 - 24	M	2	8.5	0.7		
	F	4	10.8	3.3		
25 - 44	M	6	10.3	2.3		
	F	7	10.4	1.9		
45 +	M	11	7.6	3.2	1	9.1
	F	7	7.3	3.4	1	14.3

The total number of years of formal schooling for all age groups within the community of Grande Cache is very low. On the average, persons between the ages of 15 and 24 years have approximately three years of formal education. Illiteracy rates, with the exception of females aged 15 - 19 years, range between 60 and 75 percent. Persons within this group comprise approximately 25 percent of the total population aged 15 years and over, and, because of their age, possess much inherent potential for occupational training and adjustment. However, it is very probable that this potential will not be realized because of the low average number of years of schooling and prevalence of illiteracy.

Those aged 25 years and over average less than one year of formal schooling. Illiteracy rates range between 82 and 100, with 39 people having no formal education at all. Therefore, this group possessing at best some potential for vocational changes, are in an even more disadvantageous position than the former group while comprising no less than 75

percent of the total over 15 years of age.

Contrasted with the Grande Cache situation is that of Entrance and Brule. All age groupings have achieved at least a secondary level of education with the exception of those over 45 years of age. Illiteracy within both communities is nonexistent, the 45 plus category again being the only exception. Therefore, as is the case for the total population, the indigenous labour force of the Grande Cache Region is characterized by extremely low levels of formal education.

Employment History

Persons interviewed in the survey were asked to list the occupation of all family members presently employed. Using the Census of Canada classification system, occupations reported were grouped into occupational divisions.[1] These divisions are comprised of individual classes based mainly on the kind of process performed and the kind of material worked upon, regardless of the nature of the business of the establishment in which it is carried on. For example, all carpenters, whether employed in construction, manufacturing, or other industries, are classified under the "Craftsman, Production and Related Workers" divisions of occupations in the census.

Table 6 gives this breakdown for the Alberta and C.D. 14 labour force 15 years of age and over in 1961 and the presently employed labour force of Grande Cache, Entrance, and Brule (1969). A marked difference can be observed in the proportions found in each occupational division of Alberta and C.D. 14 as compared to Grande Cache. However, the employment pattern of the Metis community appears to be quite similar to that

[1] Janssen, Svenson, and Meeks, Op.Cit., p. 85.

which would be expected in an isolated community populated largely by people of Indian descent and characterized by relatively low levels of education.

Fourteen persons or 23.7 percent of the labour force were listed as being employed in Service and Recreation. Of these 14, 13 are guides, and one is an outfitter. Essentially 29 percent are either Loggers, Fishermen, Hunters, and/or Trappers, while 41 percent are Labourers. None reported vocations within the Managerial, Professional and Technical, or other occupational divisions which must be filled by persons having employment skills obtainable only through attendance at a post-secondary educational institution.

Clearly, Grande Cache has a presently employed labour force characterized by non-technical work experience.[1] Contrasted with the Grande Cache situation is that of Entrance and Brule, both of which appear to have a labour force with a greater dispersion among the various occupational divisions.

Additional information on the employment history of the people surveyed was obtained by asking the following questions:

(1) How many jobs have you had in the past three years?

(2) What is the longest time you have spent on any job?

(3) How many weeks did you work last year?

Tables 7,8, and 9 give the average and standard deviation for each community. Sample size indicates the number of responses to each question.

The average number of jobs in the last three years for respondents from Grande Cache is appreciably higher than the average for respondents

[1] Non-technical employment is defined by the author as employment which does not require the employee to have attended a post-secondary educational institution.

from Entrance and Brule, 4.9 as compared with 1.5 and 2.1, respectively.

Workers from Grande Cache, on the average, have spent much less time on any job than workers from the other two communities. Similarly, the average number of weeks worked last year by the Metis labour force is less than the number of weeks worked by persons in Entrance and Brule.

These differences arise as a result of the seasonal nature of employment which has been characteristic of the Grande Cache community to date. Guiding, hunting, trapping and labour employment can be obtained only at certain times of the year. Therefore, it is to be expected that the indigenous labour force would, on the average, have had more jobs in the last three years, spent less time on any job, and worked fewer weeks last year than the labour force of either Entrance or Brule.

Table 6

LABOUR FORCE BY OCCUPATION

	Alberta[1] 1961	C.D. 14[1] 1961	Grande Cache 1969		Entrance 1969		Brule 1969	
	%	%	No.	%	No.	%	No.	%
All Occupations			59		12		19	
Managerial	8.5	8.2						
Professional and Technical	9.5	6.7						
Clerical	11.3	5.6			1	8.3		
Sales	6.5	3.5	2	3.4	1	8.3	1	5.2
Service & Recreation	12.1	9.9	14	23.7	4	33.4	7	36.8
Transportation & Communication	5.8	7.1			1	8.3	3	15.8
Farmers & Farm Workers	21.3	14.6						
Loggers, Fishermen, Hunters, Trappers	0.6	10.1	17	28.8				
Miners, Quarrymen & Related Workers	1.1	3.4						
Craftsmen, Production & Related Workers	17.0	21.0	2	3.4	4	33.4	4	21.1
Labourers	4.0	7.3	24	40.7	1	8.3	4	21.1
Other	2.3	2.6						

[1] Canada, Dominion Bureau of Statistics, 1961 Census of Canada, Bul. 3. 1-8 (Ottawa: Dominion Bureau of Statistics, 1961), p. 15-33, 34, 35, 36.

Table 7

NUMBER OF JOBS IN THE LAST THREE YEARS

Community	Sample Size	Average	Standard Deviation	Range
Grande Cache	28	4.9	2.6	1-12
Entrance	10	1.5	0.7	1- 3
Brule	15	2.1	2.8	1-12

Table 8

LONGEST TIME ON ANY JOB

Community	Sample Size	Average Years	Standard Deviation	Range Years
Grande Cache	25	2.3	4.3	0.1-20
Entrance	12	14.9	14.5	1-46
Brule	14	11.5	10.5	0.5-37

Table 9

NUMBER OF WEEKS WORKED DURING 1968

Community	Sample Size	Average	Standard Deviation	Range
Grande Cache	22	25.7	13.7	4-48
Entrance	9	40.4	15.8	10-52
Brule	15	48.1	9.2	17-52

Incomes

The total family income and a breakdown by source for each family was obtained from the questionnaire. Responses were given in terms of monthly incomes which were multiplied by a factor of 12 to obtain yearly figures. Because of unsatisfactory and incomplete responses, four of the 24 Metis families from Grande Cache were deleted before calculating the values for that community. One family at Entrance was unable to report its welfare income and consequently was deleted. Similarly, one Caucasian family at Brule with a gross income in excess of $40,000 was omitted because its inclusion would lead to results not representative of the community.

Averages and standard deviations were calculated for each income source. Sample size corresponding to any given income source denotes the number of families reporting that particular type of income. Percent of total income was calculated by taking all community income from that source as a percentage of total community income. Results obtained by community are presented in Tables 10, 11, and 12.

The average total family income from Grande Cache is essentially $2,380 compared with values of $5,270 and $5,517 for Entrance and Brule, respectively. The average Alberta family income in 1961 was $5,602, while the average for Canada was $5,449.[1] The comparable figure for C.D. 14 in that year was $5,105.[2]

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[1] Canada, Dominion Bureau of Statistics, 1961 Census of Canada, Bul. 4.1-3 (Ottawa: Dominion Bureau of Statistics, 1961), p. C2-1.

[2] Ibid.

Incomes for Canada, Alberta, and C.D. 14 indicate that average family incomes of Entrance and Brule compare quite favourably with those of families located elsewhere in Canada. However, Grande Cache is characterized by incomes much below the Canadian, Alberta, and C.D. 14 average.

Table 13 outlines the percentage distribution of family incomes for Alberta (1961), Grande Cache, Entrance, and Brule. The small number of families make generalizations hazardous. However, Entrance and Brule, particularly the latter, appear to have a more uniform distribution of families over the entire range of incomes.

Grande Cache, on the other hand, has a concentration of families in the lower income groups. Seventy percent or 14 families have incomes of less than $2,500 per annum. Poverty definitions are always quite arbitrary and frequently misleading. However, if one assumes an arbitrary poverty line of $4,000[1] annual income per family, 85 percent of families from Grande Cache are living under conditions of poverty. Comparable figures for Alberta, Entrance, and Brule indicate that 35, 28 and 33 percent, respectively, are living in poverty. In addition, the Grande Cache labour force is characterized by underemployment. If the annual family incomes are reduced by one-half to adjust for a community average of 26 weeks of employment during 1968, the entire Metis population can be shown to be experiencing an inadequate standard of living.

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[1] This $4,000 cut-off to define a low income family of three and four persons was obtained by assuming that expenditures of 60 percent or more of income on food, clothing, and shelter indicates straitened circumstances. Economic Council of Canada, The Challenge of Growth and Change. Fifth Annual Review. (Ottawa: Queen's Printer, September 1968), p. 109-110.

Wages as a source of income are less important at Grande Cache (66 percent) than in Entrance and Brule (75 percent). As would be expected from previous employment data, trapping, hunting and guiding are somewhat more important at Grande Cache than at the other two communities.

In general, to date the indigenous population of the Grande Cache Region has been supported by a labour force characterized by very low levels of formal education and non-technical and seasonal occupational experience. In addition, 75 percent of this group is 25 years of age or over. Consequently, it appears that the age, education, and employment history of the indigenous labour force have been instrumental in creating a prevalence of low-income families within the region.

Table 10

ANNUAL FAMILY INCOME BY SOURCE - GRANDE CACHE 1969

Source of Income	Sample Size	Average (Dollars)	Standard Deviation	Percent of Total Income
Wages	17	1843.8	1513.6	65.8
Unemployment Insurance	..	..	..	..
Welfare	10	394.8	592.6	8.3
Family Allowance	14	277.7	139.2	8.2
Pension	2	1104.0	288.5	4.7
Trapping & Hunting	8	168.0	81.1	2.8
Guiding	10	486.0	435.0	10.2
Other	..	..	..	..
Total	20	2379.6	1798.5	100.0

Table 11

ANNUAL FAMILY INCOME BY SOURCE - ENTRANCE 1969

Source of Income	Sample Size	Average (Dollars)	Standard Deviation	Percent of Total Income
Wages	9	6130.7	1791.8	74.9
Unemployment Insurance	..	..	..	..
Welfare	2	768.0	67.9	2.1
Family Allowance	8	366.0	394.9	3.9
Pension	5	2505.6	2043.7	16.9
Trapping & Hunting	1	60.0	..	0.1
Guiding	1	1440.0	..	1.9
Other	1	120.0	..	0.2
Total	14	5270.6	2543.1	100.0

Table 12

ANNUAL FAMILY INCOME BY SOURCE - BRULE 1969

Source of Income	Sample Size	Average (Dollars)	Standard Deviation	Percent of Total Income
Wages	12	5465.0	2767.4	74.3
Unemployment Insurance	2	408.0	441.2	0.9
Welfare	..	..	..	..
Family Allowance	10	240.0	135.8	2.8
Pension	4	2034.0	620.5	9.2
Trapping & Hunting	..	..	..	..
Guiding	2	3090.0	127.3	7.0
Other	3	1720.0	2151.1	5.8
Total	16	5517.0	2864.1	100.0

Table 13

PERCENTAGE DISTRIBUTION OF FAMILY INCOME

Total Annual Family Income (Dollars)	Alberta[1] 1961		Grande Cache 1969		Entrance 1969		Brule 1969	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Under 1,000	10,963	4.6	2	10.0				
1,000-1,499	6,846	2.9	6	30.0	1	7.1	2	12.5
1,500-1,999	10,140	4.2	3	15.0	1	7.1		
2,000-2,499	10,221	4.3	3	15.0	1	7.1		
2,500-2,999	11,390	4.8					2	12.5
3,000-3,999	35,105	14.7	3	15.0	1	7.1	1	6.3
4,000-4,999	40,019	16.6	1	5.0	1	7.1	2	12.5
5,000-5,999	34,753	14.5			1	7.1	2	12.5
6,000-7,999	42,791	17.8	2	10.0	6	42.9	4	25.0
8,000-9,999	17,943	7.5			1	7.1	2	12.5
10,000 Up	19,436	8.1			1	7.1	1	6.3
Total	239,607	100.0	20	100.0	14	97.7[2]	16	100.1[2]

[1] Canada, Dominion Bureau of Statistics, 1961 Census of Canada, Bul. 4.1-3 (Ottawa: Dominion Bureau of Statistics, 1961), p. C2-1.

[2] Total does not sum to 100.0 because of error as a result of rounding to the nearest tenth of a percentage point.

CHAPTER IV

THEORETICAL FRAMEWORK

Determination of the opportunity levels possessed by members of the indigenous labour force of the Grande Cache Region to improve their income and employment status following economic change requires estimations of:

(1) The total employment within the region.

(2) The proportion of total regional employment available to the Metis population.

The following literative review provides the theoretical framework by which the problem was analyzed and regional employment estimations made.

Total Regional Employment

Regional Multiplier Analysis

Estimation of the size of the labour force of the Grande Cache Region following economic change requires identification of the basic sources of employment and income on which the rest of the economy depends. Regional multiplier analysis is one very efficient and useful method of identifying certain industries as basic. It stresses the interrelations of sectors within a regional economy and the spread of impulses originating in any one sector to all other sectors, either directly or indirectly. Through the continuous back and forth play of forces, such spreading leads to a series of effects on each sector and hence indicates how growth in one sector induces growth in another.[1]

Such an analysis can be designed to handle any number of variables. Yet, the more variables a design encompasses, the more difficult it is to

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[1] Walter Isard, et al., Methods of Regional Analysis: An Introduction to Regional Science (New York: John Wiley & Sons, Inc., 1960), p. 189.

leave the conceptual stage and derive results of direct usefulness. The most comprehensive regional multiplier analysis to yield quantitative results of some value is that associated with the use of the interregional input-output technique. In contrast, the most simple and straightforward type of regional multiplier analysis is associated with economic base studies.[1]

Given definite time, finance and data constraints, identification of the basic sources of income and employment within the Grande Cache Region through the use of economic base theory was necessary. Consequently, it will constitute the theoretical framework whereby the size of the regional labour force is estimated.

Economic Base Analysis

The economic base of a region refers to those activities which export goods and services to points outside the economic confines of the region. These basic (export) enterprises, through their export function, earn a dollar inflow for the region from surrounding areas and hence constitute the wealth producing sector of the local economy.[2] As prime movers, "the region will grow proportionally to the expansion of these industries."[3]

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[1] Ibid.

[2] Richard B. Andrews, "The Economic Base Theory and Its Implications," in The Techniques of Urban Economic Analysis, ed. by Ralph W. Pfouts (West Trenton, New Jersey: Chandler-Davis Publishing Co., 1960), p. 6.

[3] Charles L. Leven, "The Economic Base and Regional Growth," Research and Education for Regional and Area Development (Ames, Iowa: Iowa State University Center For Agricultural and Economic Development, 1966), p. 81.

That economic section of the region directly supported by the base is referred to as nonbasic activity.[1] Nonbasic activities include enterprises that provide goods and services for the consumption of local residents. "The dependency of nonbasic activity upon base activity is evident in the fact that employment and profitability in service activities are highly sensitive to change in the base,"[2] either rising or falling with it.

Empirical delineation of basic industries can be extremely difficult. The problem is compounded because of the indirect nature of modern production whereby the product of one local firm can constitute an input to an export industry. Hence the question of whether the local firm is basic or nonbasic arises. Hoyt presents a concise listing of urban base activity types in which he distinguishes the fundamental employment and income sources that might be found in a modern city. He includes[3] (1) manufacturing, (2) trade, (3) extractive industries, (4) governmental activity, (5) educational institutions, (6) resort and amusement centers, and (7) retirement.

For the purposes of this study, Tiebout's more comprehensive definition of basic industries will be used:[4] Basic industries are those whose level of activity is not closely tied to the level of economic activity of the local economy.

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[1] Nonbasic activity is also referred to as service, domestic or residentiary activity. Andrews, Op. Cit., p. 6.

[2] Andrews, Op. Cit., p. 6.

[3] Arthur Weimer and Homer Hoyt, Principles of Urban Real Estate (New York: The Ronald Press Co., 1939), p. 49-52.

[4] Charles Tiebout, The Community Economic Base Study, Supplementary Paper No. 16 (New York: Committee for Economic Development, December, 1962), p. 74.

In the short-run,[1] other sectors besides exports can be considered as basic; local housing investment is an example of one such sector. Over the long-run[2] only the export sectors appear as basic. The locally oriented industries will grow or decline along with the growth or decline of the export sectors.[3]

Economic change is occurring within the Grande Cache Region primarily as a result of the location of the mine and power plant within the area and the building of the new town of Grande Cache as a service center. In addition, because of the export nature of the coal and electricity, plus the relatively small size of the region, only a small percentage of both industries' production will be locally oriented. Essentially 100 percent of the coal mined by McIntyre Porcupines Ltd. will be exported to Japanese markets. Similarly, a large proportion of the electric production from the power plant will be supplied to the provincial power grid, although some will be required to service the town and the mine. Therefore, using Tiebout's definition of basic industries, McIntyre Porcupine Mines Ltd. and Canadian Utilities Ltd. clearly constitute the economic base of the Grande Cache Region.

Measurement of the Economic Base

There is no single most appropriate measurement unit of the economic base. Income, employment, value added, sales, and possibly some others: All can be appropriate units. Which unit one chooses depends

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[1] The short-run is defined by Tiebout as periods from a few months up to two years. Tiebout, Op. Cit., p. 57.

[2] The long-run is defined by Tiebout as periods greater than two years. Tiebout, Op. Cit., p. 57.

[3] Tiebout, Op. Cit., p. 74.

upon the purpose of the study and available data. Therefore, given the objective of employment estimation, this study will use employment as the unit of measurement of the regional economic base.[1] There are, however, limitations to this approach.[2] First, data on number of jobs do not indicate the significance for total expansion of different wage levels in different industries or activities. For example, the same increases in employment for two industries paying significantly different wages lead to different secondary (multiplier) effects.[3] Second, employment data do not reflect the expansionary effects which result over a period of years from changes in physical productivity. Considerable expansionary effects can be associated with little or no change in employment in basic industries; the effects instead result from the increase in productivity in these industries.[4]

Measurement of the base can be done either directly or indirectly. Primarily, economic base studies have sought to use indirect methods to measure the sectors because of cost constraints. Tiebout outlines the three most common indirect methods: (1) the assumption approach, (2) the location

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[1] For a discussion of the virtues of the other units of measurement, refer to Tiebout, Op. Cit., p. 46-77; Andrews, Op. Cit., p. 46-47.; and Weimer and Hoyt, Op. Cit., p. 109.

[2] For a more complete discussion refer to Andrews, Op. Cit., p. 67-69.; and Isard, et al., Op. Cit., p. 194-195.

[3] Richard B. Andrews, "Mechanics of the Urban Economic Base", Land Economics, (Feb., 1954), 53.

[4] Ibid.

quotient, and (3) the minimum requirements technique.[1] The limitations of indirect measures of the export sector are numerous;[2] however, these limitations can be largely overcome through direct measurement when feasible, usually involving a survey of consumers and firms. Thus, to determine the economic base of the Grande Cache Region, McIntyre Porcupine Mines Ltd. and Canadian Utilities Ltd. were approached directly for estimates of the basic employment which each industry will provide.

Base Ratios

Given the division of employment into two broad groups, export and domestic, it is a simple procedure to compute a basic-service ratio.[3] This ratio purports to describe the proportion between total employment in basic or export activities and total employment in service or local activities. From the data required to compute the basic-service ratio, a regional multiplier is easily calculated. This multiplier is equal to total (or increase in) employment in both basic and service activities divided by total (or increase in) basic employment.[4]

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[1] For a complete discussion of both direct and indirect methods of measuring the export sector, refer to Tiebout, *Op. Cit.*, p. 46-50.; Isard, *et al.*, *Op. Cit.*, p. 194-198.; Andrews, "Mechanics of the Urban Economic Base: General Problems of Base Indentification," in *The Techniques of Urban Economic Analysis*, p. 81-96.; and Andrews, "Mechanics of the Urban Economic Base: Special Problems of Base Identification," in *The Techniques of Urban Economic Analysis*, p. 97-115.

[2] *Ibid.*

[3] Isard, *et al.*, *Op. Cit.*, p. 190.

[4] For a more comprehensive discussion of base ratios, refer to Andrews, "Mechanics of the Urban Economic Base: The Concept of Base Ratios," in *The Techniques of Urban Economic Analysis*, p. 139-152.; and Weimer and Hoyt, *Op. Cit.*

Once the basic-service ratio and regional multiplier have been calculated, it is a simple procedure to use them for projection purposes. By evaluating future prospects of expansion in basic activities within the region under study, forecasts of expansion in nonbasic and total employment can be made. Through the use of employment-to-population ratios the forecasts are often extended to include the future population that could be supported by total future employment opportunities.

The idea of arithmetic ratios, which found its first clear cut and explicit statement in the writings of Homer Hoyt, has not been greatly expanded or refined.[1] Early observations by Hoyt indicated that the basic-service ratio in cities was close to one to one. Later he discovered, through more thorough and comprehensive studies, that the basic-service ratio varies markedly among cities.[2]

Reference to the literature further substantiates Hoyt's conclusions. Various empirical studies suggest that the actual number of nonbasic positions obtained as a result of industrialization is highly variable from one situation to another.[3] D. E. Willmott, in a 1961 study

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[1] Andrews, "Mechanics of the Urban Economic Base: The Concept of Base Ratios," in The Techniques of Urban Economic Analysis, p. 141.

[2] Isard, et al., Op. Cit., p. 190 footnote.

[3] Various estimates of the number of service jobs created by 100 new manufacturing jobs include (1) 1, by Charles Tiebout, "The Community Income Multipliers," a case-study paper presented at the joint Conference of the Econometric Society and the American Statistical Association, September, 1956; (2) 124, by George H. Hilderbrand and Arthur Mace, "The Employment Multiplier in an Expanding Industrial Market: Los Angeles County 1940-47, "Rev. Econ. and Stat., 32 (Aug., 1950), 241-249; and (3) 141, in Lincoln, Nebraska, by Gerald E. Thompson, "An Investigation of the Local Employment Multiplier," Rev. Econ. and Stat., 41 (Feb., 1959), 61-67.

of the effects on Esterhazy, Saskatchewan of the building of a multi-million-dollar potash plant, points out that "these differences are due both to inadequate methods of obtaining estimates, and to very great differences between the towns and cities from which the original figures were derived."[1] Furthermore, the lack of comprehensive economic data makes it extremely difficult to measure the secondary effects of new construction and new employment. In short, the actual size of the basic-service ratio observed depends upon the characteristics of the region, the nature of the economic base itself, geographical location of the region, regional economic cycles, distribution of age groups within the population, and the make-up of the labour force.[2]

Therefore, the use of base ratios in estimating the impact on a region resulting from the location of a new industrial plant within the area has definite limitations.[3] An attempt was made to overcome this problem by a review of the literature with the objective to find empirical results representative of the Grande Cache Region. However, no completely satisfactory published research results were found. One extensively quoted United States Chamber of Commerce study indicates that over a ten-year period 100 new manufacturing jobs in a community means 65 new domestic jobs

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[1] Donald E. Willmott, Industry Comes to a Prairie Town (Saskatoon, Saskatchewan: Center for Community Studies, University of Saskatchewan, 1962), p. 28.

[2] For a more complete discussion of the causes of variability in base ratios refer to Andrews, "Mechanics of the Urban Economic Base: The Concept of Base Ratios," in The Techniques of Urban Economic Analysis, p. 143-146.

[3] For a more comprehensive discussion of the limitations of Economic Base Theory, refer to Ralph W. Pfouts, ed., The Techniques of Urban Economic Analysis, p. 213-358.; and Isard, et al., Op. Cit., p. 194-205.

and 359 more people.[1]

Canadian National Railways, using the same general approach, measured the economic changes occurring in eight Canadian counties in which manufacturing activity had increased between 1941 and 1961 as contrasted with eight counties where manufacturing activity had not increased. Of the eight counties selected, one was in Nova Scotia, three in Quebec, three in Ontario, and one in British Columbia. Results obtained indicate that 100 additional manufacturing jobs within a community will cause total employment to increase by 149 and total population to rise by 479.[2]

Most of the problems which arise in a study of this nature are related to the question of whether or not increases in non-manufacturing sectors of the community's economy are actually the result of increases in manufacturing employment. If valid conclusions are to emerge from the study, some means must therefore be found of eliminating influences that originate outside the community. To this end,

> . . . an attempt was made to exclude those areas which were close to major centres of population. Also, the selection was restricted to counties where the population was not too large; larger communities, because of their size, develop a more complex pattern of cross influences. On the other hand, counties chosen had to be large enough so small irregular influences would not have a disproportionate effect on some of the factors under consideration.[3]

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[1] United States Chamber of Commerce, What New Industrial Jobs Mean to a Community (Washington, D.C.: United States Chamber of Commerce, 1962).

[2] Canadian National Railways, What Increased Manufacturing Employment Means to Community Growth (Montreal, Quebec: Research and Development, CNR, 1962).

[3] *Ibid.*

Other criteria considered in the selection of the counties were:[1]

(1) Manufacturing employment should have shown a substantial increase between 1941 and 1961.

(2) Manufacturing employment in 1961 should be a substantial proportion of total employment.

(3) A substantial proportion of employment change between 1941 and 1961 should have occurred in manufacturing employment.

These latter criteria also help to guard against attributing growth to an increase in manufacturing activity when some additional exogenous factor is exerting a significant influence upon the local economy.

Objectivity appears to have been exercised in the selection of the sample counties, and the study was conducted logically over a long period of time. The basic-service ratio obtained of 100-49 is conservative when compared with either the United States Chamber of Commerce study or Hoyt's earlier ratios. Hence, the results of the Canadian National Railways study have been used to estimate the size of the regional labour force following economic change within the Grande Cache Region.

Employment Available to the Indigenous Labour Force

It is very probable that the new jobs created within a region as a result of economic development will, in large part, be different than those in which the local people were formerly employed. If the indigenous labour force is to realize improved employment opportunities, vocational changes or migration[2] will be required. A review of the literature of migration rates indicates that they are significantly influenced by three variables -

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[1] Ibid.

[2] Migration is defined by the author as a change of occupation.

age, education and occupational experience.

Generally, one expects the extent to which people can participate in economic change will be reduced as the average age of the population increases. The age of the migrant has been proven to be a significant variable in determining the rate of farm-nonfarm migration. Cohen and Schuh, in an Indiana study, conclude that "the younger the members of the labour force, the greater is migration."[1] Guither had similar conclusions when he noted a "significant difference in the age distribution between the group that left and the total farm population."[2]

Education is one of the most important factors considered by employers in their personnel recruiting programs. They usually insist upon a certain level of education before any applicant is accepted, and the requirements are continually rising. Mobility studies show that as the educational qualifications of the potential migrant increases, the probability of obtaining satisfactory industrial employment is enhanced.[3]

The amount and type of occupational experience will be a major determinant of the skills possessed by any given labour force. Diehl found that "the skill variable indicated a large response of prospective migrants to rewards for nonfarm job experience."[4] Baumgartner, using the attitudinal variable "potential mobility" found that "nonfarm work

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[1] Lois K. Cohen and G. Edward Schuh, Job Mobility and Migration, Res. Bull. 763 (Lafayette, Indiana: Purdue University Ag. Exp. Sta., May,1963),p.2.

[2] Harold D. Guither, "Factors Influencing Farm Operator's Decisions to Leave Farming," Journal of Farm Economics, 45, Pt.1 (1963), 568.

[3] Cohen and Schuh, Op. Cit.,p. 1.

[4] William D. Diehl, "Farm-Nonfarm Migration in the Southeast: A Costs Returns Analysis," Journal of Farm Economics, 48, No. 1 (February 1966), 10.

experience was associated positively with potential mobility among farmers irrespective of age."[1]

Therefore, age, education and previous employment are very instrumental in determining migration rates and the success experienced in obtaining industrial employment. Consequently, use of the three variables has enabled the quality of the indigenous labour force of the Grande Cache Region to be determined in Chapter III.

In summary, economic base theory and base ratios enable identification of the basic sources of employment and income within the region and estimation of the size of the total regional labour force. The qualitative variables age, education, and employment history facilitate estimation of the amount and type of total regional employment available to the indigenous labour force. Together they provide a theoretical framework whereby the opportunity levels possessed by members of the indigenous labour force to improve their income and employment status following economic change are determined in the following chapter.

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[1] H.W. Baumgartner, "Potential Mobility in Agriculture: Some Reasons for the Existence of a Labor-Transfer Problem," Journal of Farm Economics, 47, Pt. 1 (1965), 82.

CHAPTER V

REGIONAL EMPLOYMENT ESTIMATION

Total Regional Employment

At the beginning of the fourth quarter of 1970 McIntyre Porcupine Mines Ltd. will be employing a maximum of 777 employees (552 underground and 225 on the surface).[1] Although final plans have yet to be formulated, preliminary estimates are that the Canadian Utilities Ltd. power plant will be in operation by mid-1972 with a total employment of 35.[2] Hence, total basic employment will be 812.

Using a basic-service employment ratio of 100-49 as a basis for projection, the ultimate regional nonbasic labour force will be approximately 398. It follows that total regional employment following economic change will be in the neighbourhood of 1,210.

The preceeding estimates are based upon the assumption that only the initial employment at the two industrial sites will influence the final population structure of the local economy. If McIntyre Porcupine Mines are successful in increasing the magnitude of their sales, employment will expand accordingly. Expansion of employment above 777 will depend upon the extent to which additional markets develop, as well as on the amount of Group II coking coal that is discovered as a result of future explorational activity by the company. Similarly, additional employment would result from the

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[1] Tables 1 and 2 in Appendix 3.

[2] Telephone interview with Mr. D. Mitchell, Manager of Personnel, Canadian Utilities Ltd., Milner Building, Edmonton, May 5, 1969.

establishment of other basic industries within the region. However, all are variables outside the delineated scope of this study.

The time horizon over which the projections are assumed valid has not been specifically defined. Presently McIntyre Porcupine Mines Ltd. are actively promoting residential construction, and the Board of Administrators for the New Town of Grande Cache is taking sealed construction tenders in an effort to develop the new town as rapidly as possible. Plans have been made for the provision of 25 employee homes for Canadian Utilities Ltd. in 1972.[1] Therefore, the estimated total regional employment of 1,210 and domestic labour force of 398 will not be achieved until some time after 1972, although construction within the new town is proceeding at a rapid pace. The town of Hinton realized a population increase of 3,300, rising from 200 to 3,500 within a period of approximately two years following the establishment of the pulp mill.[2] Consequently, it seems reasonable to assume that the projections are realistic for the year 1974.

Basic Employment

To determine the employment obtainable by the indigenous labour force within the basic sector of the regional economy, officials of both export industries were approached for information regarding the technical competence and minimum educational levels required of their employees. Once obtained, this information was compared with the educational levels

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[1] Personal interview with Mr. L.L. Gurel, Chairman, Board of Administrators, Alberta Department of Municipal Affairs, April 8, 1966.

[2] Alberta Bureau of Statistics, Survey of Town of Hinton - 1958 (Edmonton: Department of Industry and Labour, June 2, 1958).

and work experience of the indigenous labour force to determine the possibility of employment within each industry.

Canadian Utilities Limited

The letter in Appendix 2 from Canadian Utilities Ltd. succintly outlines the educational and technical requirements for future staff at Grande Cache. The company's personnel policy requires that every employee should have completed Grade XI with a minimum of 65 credits and a "B" standing in Grade XI Mathematics, Science, and English.

Staff of the plant at Grande Cache will be required to hold a "first", "second", and "third" class Steam Engineers Certificate in accordance with "The Boilers and Pressure Vessels Act." These individuals will be performing shift engineer and fireman duties at the plant. In addition, there will be a requirement for welders who hold a "B" pressure ticket in accordance with the apprenticeship programs of the province.

The company feels that it is difficult to forecast other specific categories of personnel required at this time, but graduates of NAIT and SAIT technology programs in the fields of chemical, electrical and electronic technology could be included.

The average level of education for all age groups within the Grande Cache labour force is appreciably below that required of employees of Canadian Utilities Ltd. (Table 3). In addition, the employment history of the native people has not provided them with the necessary skills to undertake technical employment. To date they have earned a living largely by guiding, trapping, hunting and manual labour employment. Therefore, the indigenous labour force of Grande Cache Region is unlikely to benefit directly from increased employment provided by the Canadian Utilities Ltd. power plant.

McIntyre Porcupine Mines Ltd.

Coal mining today is highly mechanized and requires a high degree of technical competence by all miners. The high level of skill is obtained partly by apprenticeship training and partly by actual work experience. Company policy further requires that all employees possess at least a grade ten level of education. Consequently, to obtain labour of the quality necessitated by present mining technology, McIntyre Porcupine Mines Ltd. has been forced to recruit employees from outside both the region and the province.[1]

Therefore, as is the case with Canadian Utilities Ltd., it would appear that a very small percentage of the indigenous labour force of the Grande Cache Region will obtain employment with McIntyre Porcupine Mines Ltd. Both basic industries will be forced to fulfill their labour requirements largely from exogenous sources, essentially precluding employment for most of the indigenous labour force.

Employment During The Clearing and Construction Phase

To determine the employment obtainable by the local people during the clearing and construction phase of both the mine site and the new town of Grande Cache, companies that had been awarded contracts at the time of writing were approached regarding their present and future employment policies. However, at the time very few firms were as yet operational in the area.

The company with the "clearing and burning contract" for the town employed approximately 15 native people as labourers and power saw

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[1] Personal interview with Mr. G. Hartley, Production Manager, Coal Division, McIntyre Porcupine Mines Ltd., 729 Centennial Building, Edmonton, April 7, 1969. Mr. Hartley stated that at that time the company was recruiting employees in Nova Scotia.

operators on a relatively regular basis during February and March of 1969.[1] Initial clearing and construction on the mine site commenced in March of 1969, and approximately 70 people were hired to clear land, build bridges and buildings, and clear roads. Of the 70 employees, most were from within the Grande Cache Region. Apparently the work will continue for about one and one-half years, with the employment level fluctuating periodically.[2] Most of the other firms awarded contracts had just commenced operations and had no definite employment policy formulated.

Because clearing and construction operations within the region were being initiated at the time of writing (April and May, 1969), no quantitative estimates as to the employment available were obtained. However, the principal discovery as a result of this research is that local people will be employed quite extensively as labourers for clearing and construction operations. Once the phase has been completed, this source of employment will essentially become non-existent.

Employment Available to the Indigenous Labour Force

Due to the technical nature of the productive processes of both basic industries and the resulting requirements for employees with high education qualifications and adequate practical experience, employment of indigenous labour force within the basic sector of the regional economy will be largely precluded. Hence, the nonbasic sector will be the principal source of increased job opportunities if they exist at all.

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[1] Determined as a result of examination of the employment records of Devon Thread and Pipe Fitting Ltd., P.O. Box 371, Devon, Alberta, April, 1969.

[2] Personal interview with Mr. J. Gartner, Assistant Site Manager, Killborn Engineering, 729 Centennial Building, Edmonton, May, 1969.

The employment opportunities available to the indigenous labour force were determined by assuming that the town of Hinton and its labour force in 1961 is representative of the Grande Cache Region following economic change. In the early 1950's the village of Hinton was supporting a population of 200 people, 185 miles west of Edmonton. North Western Pulp and Power Ltd. was granted extensive timber holdings in the area in 1955 and elected to establish its bleached kraft pulp mill at Hinton. By 1958 when the mill had been in operation almost two years, the population had increased by 3,300 to 3,500. The work force at the mill was 562 with an additional 600 persons working on woodlands operations.[1]

An economy based upon a pulp mill will differ somewhat in economic characteristics from an economy based upon a coal mining operation and a power plant. However, it is believed that Hinton is representative of future developments in Grande Cache. Both are located in the same geographical area, are a significant distance from the influences of a large city, have no agricultural hinterland, and are supported almost exclusively by a one or two industry basic sector.

Assuming that the 1961 Hinton labour force is representative of the Grande Cache Region following economic change, it follows that the percentage distribution among occupational divisions of the labour force will be very similar. Given a total regional employment level of 1,210 (812 basic and 398 nonbasic) and using the percentage distribution of Hinton's 1961 labour force as a basis for projection, the total number of jobs potentially available within each occupational division were calculated for the Grande Cache Region. Estimations of job availability were

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[1] Alberta Bureau of Statistics, Op. Cit.

then compared with the present breakdown of the Grande Cache labour force (obtained from Table 6) to determine nonbasic employment available to the indigenous people of the region (Table 14). Since comparisons are made on the basis of total employment, and given that basic employment is essentially precluded, any jobs which may be available to the local labour force can be assumed to be of nonbasic origin.

Craftsmen, Production, and Related Workers comprised 27.2 percent of the 1961 Hinton labour force, due largely to the existence of the pulp mill as the one major industry within the town. Miners, Quarrymen, and Related Workers, on the other hand, made up only 0.2 percent of total employment. In the case of the Grande Cache Region, the converse will be true to a considerable extent. Because McIntyre Porcupine Mines Ltd. is the principal basic industry within the region, the category Miners, Quarrymen, and Related Workers can be expected to include a greater percentage of total employment. Similarly, Craftsmen, Production, and Related Workers will have lesser importance than was the case in Hinton in 1961, although some employees of Canadian Utilities Ltd. will be included within this latter category.

Employment at the power plant will constitute 4.3 percent of total employment within the region. Many of these workers will be employed within the Craftsmen, Production, and Related Workers Division, but some will gain employment in other categories such as Managerial, Professional and Technical, and Clerical.

Therefore, on the basis of a priori reasoning, 3.4 percent of total employment within the region was assumed to be obtained within the Craftsmen, Production, and Related Workers Division. Consequently, the Miners,

Quarrymen, and Related Workers Division would include 24.0 percent of total jobs, if the percentage distribution among the other occupational divisions within the region is the same as the Hinton labour force in 1961. Estimated regional employment figures in Table 14 have been adjusted accordingly.

In all cases the number of estimated jobs available within the various occupational divisions are greater than the number of local people who may possibly seek such employment. Therefore, it would appear that the indigenous labour force may be able to find employment within the nonbasic sector of the regional economy.

However, the actual jobs obtained will be dependent upon the age, educational levels, and employment history of the indigenous labour force. In all age groups the average number of years of formal schooling is extremely low; so low in fact that a very small percentage of the population 15 years of age and over are literate. The problem is compounded when persons aged 25 years and over and possessing at best some inherent potential for vocational changes comprise 75 percent of this group. The non-technical and seasonal employment history of the local people, consisting primarily of hunting, fishing, guiding, and manual labour employment, has not provided them with technical employment skills. Hence, employment in occupational divisions such as Managerial, or Professional and Technical will be largely precluded.

One occupational division in which employment prospects apparently could become particularly bright is that of Service and Recreation. The cultural values, traditions, and employment history of the Metis population make them well prepared to serve as guides on trail rides and hunting trips. It is probable that, of the 166 estimated Service and Recreation

jobs, a large number will be within the guiding and outfitting facet of the industry. Presently the Metis people are primarily engaged in seasonal vocations, approximately 20 percent of which are guides. Only one person (two percent of the regional labour force) is an outfitter. It would appear that more seasonal employment in the form of guiding is unlikely to benefit the local population greatly. Therefore, if members of the indigenous labour force are to realize an improvement in their employment status in the Service and Recreation division, they must provide the capital and managerial resources required of a modern outfitting operation.

In general, the indigneous labour force of the Grande Cache Region will likely be able to obtain nonbasic employment following economic change. However, it is probable that low levels of formal education, age, and non-technical work experience will dictate that employment remain within the status in which the Metis people are presently working. Positions requiring higher levels of professional and technical competence will largely be filled from exogenous sources. Economic development will create additional employment within the region, but the native population will find advancement above their present employment and income status effectively blocked.

Table 14

ESTIMATED REGIONAL EMPLOYMENT RELATIVE TO THE GRANDE CACHE LABOUR FORCE

	Hinton, 1961[1] Percent	Estimated Regional Employment, Number	Grande Cache Number
All occupations	..	1210	59
Managerial	10.6	128	..
Professional and Technical	10.3	126	..
Clerical	10.7	129	..
Sales	4.2	51	2
Service & Recreation	13.7	166	14
Transportation & Communication	5.6	68	..
Farmers & Farm Workers	0.7	8	..
Loggers, Fishermen, Hunters, Trappers	7.7	93	17
Miners, Quarrymen & Related Workers	0.2 (24.0)[2]	290	..
Craftsmen, Production & Related Workers	27.2 (3.4)[2]	41	2
Labourers	5.6	68	24
Other	3.5	42	..

[1] Canada, Dominion Bureau of Statistics, 1961 Census of Canada, Bul. 3.1-8 (Ottawa: Dominion Bureau of Statistics, 1961), p. 14-21, 22.

[2] Adjusted percentages to account for differences between the 1961 Hinton labour force and the estimated regional labour force.

CHAPTER VI

SUMMARY AND CONCLUSIONS

The Grande Cache Region of Alberta is about to undergo economic change following development of the reserves of the Smoky River Coal Fields. Consequently, economic development of the region will occur. In this study an attempt has been made to determine the natural resource potential of the area, the present income status of the native population, and the employment opportunities of the indigenous labour force following economic change.

Natural Resource Potential of the Area

Land to the north and east of the Grande Cache Region is characterized by abundant forestry resources. One pulp mill is now operational within the town of Hinton, and management plans call for an expansion of the mill to double its present capacity by 1973. A further increased rate of commercial exploitation of the area's forest reserves is probable in the near future as two additional mills may be established within the Grande Prairie and Whitecourt Forests, pending the results of current feasibility studies. However, because these exploitable forest areas are not in close proximity to the Grande Cache Region, such exploitation is likely to have little effect upon the indigenous population.

The area, constituting part of the Athabasca and Smoky River Basins, is characterized by moderate water supplies. Consequently, the presence of an ample but not abundant supply of water could be instrumental in the attraction of new industries to the area, or the expansion of existing operations.

The potential for recreation and tourism within the area is quite

good, particularly with respect to sport fishing and big game hunting. A limitation of the area is that it does not have the inherent capacity to support large numbers of people per unit area. However, the large territory involved indicates that prospects for future expansion of the industry are quite bright. The degree to which future expansion does occur will depend upon political and economic factors influencing either private or public development of the industry.

Legislators and others who are interested in this particular area must recognize the fact that a direct conflict of interests exists. The decision must be made whether to develop natural resources for industry or for recreation and tourism. If resources are designated for industrial use, this will mean a decline in the natural beauty, isolation, and wildlife potential of the area. In turn, employment in Service and Recreation would be greatly reduced. To illustrate, since the inception of Willmore Wilderness Park in 1959 its boundaries have been changed twice, resulting in a 20 percent reduction of its area. On the other hand, if the decision was made to establish constraints prohibiting industrial resource development of the area, employment in Service and Recreation would expand accordingly.

The known reserves of oil, natural gas, sulphur, and other minerals are not large and/or economic to produce at this time. However, future explorational activity may yield positive results.

Total coal reserves within the Grande Cache Region and surrounding areas, although as yet unknown, are very large. If present investigations reveal that much of the coal has high coking qualities, a large future expansion of the industry is highly probable. It follows that a major stimulus to the economy of the Grande Cache Region would be

iniated, and economic development could be sustained for a long period of time if world demand for coal remains strong.

Present Income Status of the Native Population

The average annual income of the Grande Cache community is $2,380 compared with $5,270 and $5,517 for Entrance and Brule. In 1961 the average Alberta family income was $5,602, while comparable figures for Canada and C.D. 14 in that year are $5,449 and $5,105.

Examination of the percentage distribution of family incomes reveals that those from Grande Cache are concentrated in the low-income groups. Only 15 percent have average annual incomes equal to or greater than $2,500 per annum. If a yearly income of less than $4,000 is used to define a low-income family of three and four, 85 percent of the families from Grande Cache are living in poverty. Adjustment of annual family incomes to account for seasonal unemployment would mean that the entire Grande Cache population consists of low-income families. Wages constitute 66 percent of total family income at Grande Cache contrasted with 75 percent in Entrance and Brule. Guiding, trapping, and hunting are more important income sources in the Metis community. Therefore, the indigenous population of the Grande Cache Region has been living in a state of poverty, earning a low annual income in highly seasonal vocations.

Employment Opportunities of the Indigenous Labour Force

Employment opportunities experienced by members of the indigenous labour force following economic change will be dependent upon their age,

formal education, and employment history. If the total potential labour force is defined as persons 15 years of age and over, those under 25 years constitute only 25 percent of the total labour force. Persons within this category, because of their age, possess much inherent ability to make occupational adjustments. However, due to an average of approximately three years of formal schooling and illiteracy rates of between 60 and 75 percent, members of this group will experience limited employment opportunities.

Persons 25 years of age and over and having less inherent ability to make vocational changes constitute 75 percent of the total potential labour force. Individuals within this category are in an even more disadvantageous position than the former group, as they average less than one year of formal education and illiteracy is in excess of 80 percent.

The occupational experience of the Metis people is very non-technical. Presently they are earning a living in such seasonal vocations as guiding, hunting, trapping, fishing, and manual labour employment. Consequently, it is highly probable that the skills possessed by the indigenous labour force of the Grande Cache Region are very rudimentary.

McIntyre Porcupine Mines Ltd. and Canadian Utilities Ltd. have very specific manpower requirements. As a result the native people, because of their inadequate formal education and work experience, will find it very difficult to obtain employment within the basic sector of the regional economy. Both export industries will be forced to fulfill their labour requirements primarily from exogenous sources.

Periodic manual labour employment will be available to local people during the clearing and construction phase of the mine and the town site. However, as a source of employment, the phase will exist for approximately one year and nonbasic employment will be the principal source of increased permanent job opportunities. Due to the large size of the estimated nonbasic employment (398) relative to the present Grande Cache labour force (59), it appears that the local population will find ample opportunity to obtain employment within the nonbasic sector.

Service and Recreation, in particular, could provide excellent employment opportunities for the indigenous people. Their employment history, in conjunction with their cultural values and traditions, make them well prepared to serve as guides. The estimated Service and Recreation manpower requirements of 166 indicate that there will be a strong demand for guides and outfitters in the future. In addition, the area has good potential for tourism and recreation in the form of sport fishing and big game hunting, particularly in Willmore Wilderness Park. Consequently, it would appear that future growth of the industry is possible. If the native people are able to accept the more demanding managerial responsibilities of outfitting, it is quite conceivable they can improve their employment and income status accordingly.

In general, the age, formal education and employment history of the indigenous labour force all militate against obtaining technical employment. Hence improvement of their present employment status is unlikely. Following economic change within the region the local people

will benefit from increased job opportunities in the vocations in which they are presently employed. Positions requiring skills obtainable through post-secondary training which would enable them to improve their employment status will largely be filled from sources outside the region.

Industrial development will create many new jobs within the region. It has been shown that the Metis population will be largely by-passed by the increased employment and hence benefit very little from regional economic development unless they are given assistance to adapt to the changed economic environment. One possible alternative is a re-training program to help the local people obtain employment within the regional economy. Determination of the specific program to be implemented is outside the delineated scope of this study and worthy of additional research. However, the indigenous population of the Grande Cache Region is in need of assistance following economic change and present developments within the region may serve as a dictate of the direction to be taken in policy formation.

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APPENDIX I

MAP I

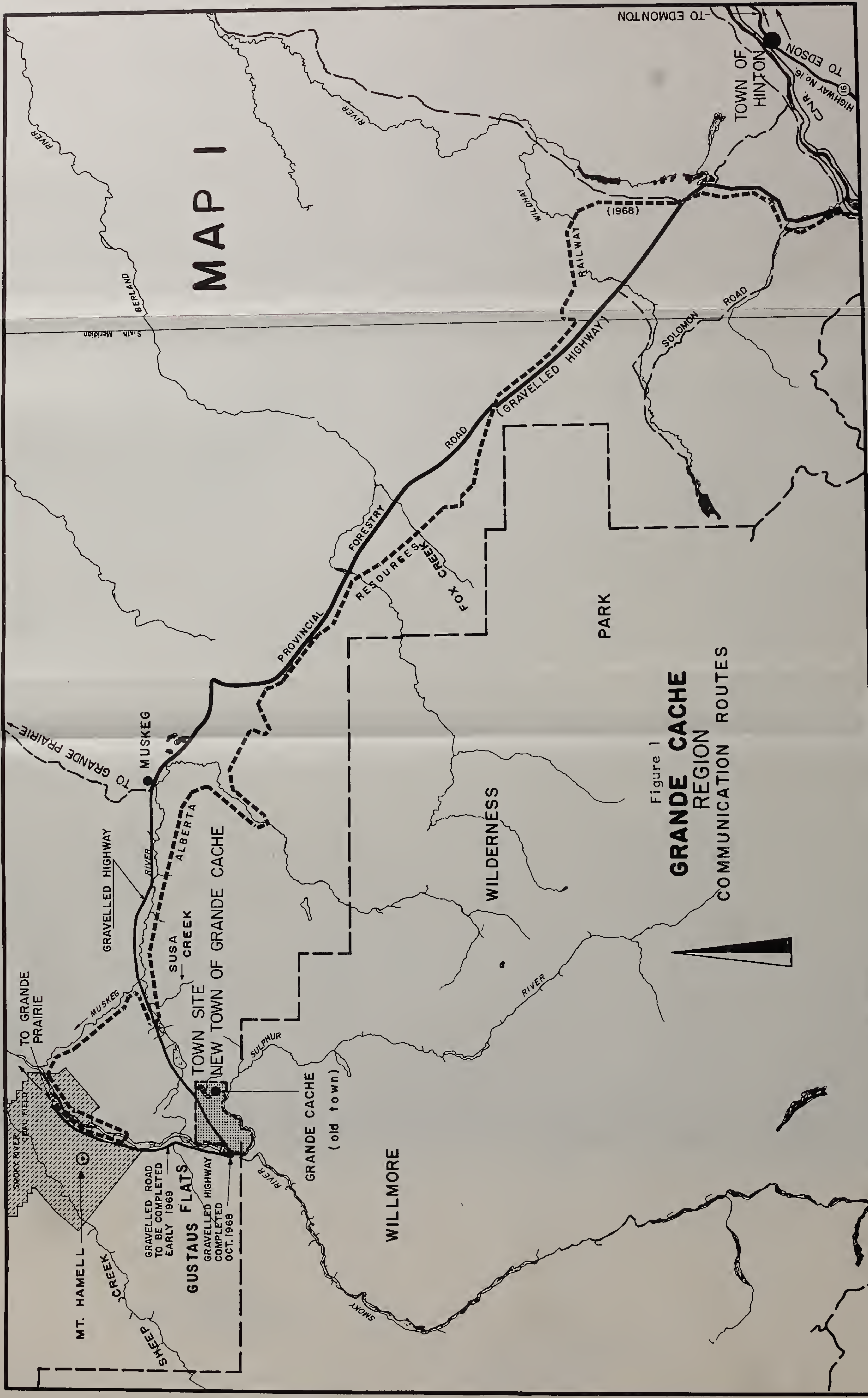

Figure 1
GRANDE CACHE
REGION
COMMUNICATION ROUTES

MAP 2

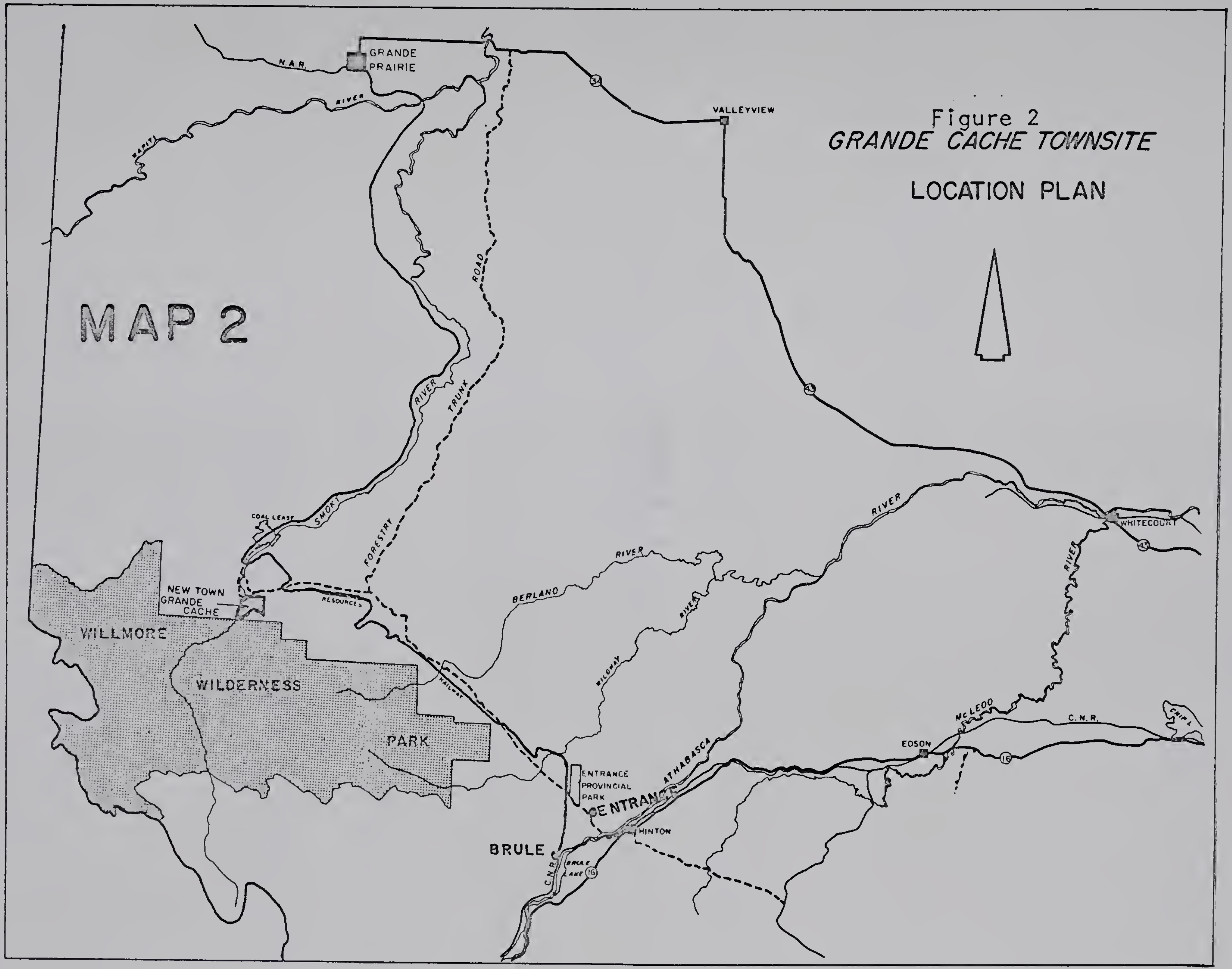

Figure 2
GRANDE CACHE TOWNSITE
LOCATION PLAN

APPENDIX 2

Canadian Utilities, Limited

MILNER BUILDING 10040 104TH STREET

TELEPHONE 424-6161

Edmonton, Alberta

May 12, 1969.

Mr. T.P.Adams,
Graduate Teaching Assistant,
Department of Agricultural Economics,
The University of Alberta,
EDMONTON, Alberta.

Dear Mr. Adams:

In reply to your letter of May 6, 1969 regarding educational and technical requirements for future staff at Grande Cache, I hope the following information will be of some assistance.

The Company's minimum educational requirements are a Grade XI completion with a minimum of 65 credits including a "B" standing in a Grade XI Mathematics, Science and English course.

The requirements to staff this plant will include personnel holding a "first", "second" and "third" class Steam Engineers Certificate in accordance with "The Boilers Act". These individual will be performing shift engineer and fireman duties at the plant.

In addition to the aforementioned positions, there will be a requirement for welders who hold a "B" pressure ticket in accordance with the Apprenticeship programs of the Province.

It is difficult to forecast other specific catagories of personnel required at this time however, graduates of NAIT and SAIT technology programs in the fields of Chemical,Electrical and Electronicscould be included.

Our total force will probably not exceed 35.

Yours truly,

CANADIAN UTILITIES, LIMITED,

D.B. Mitchell,
Manager of Personnel.

JLF:LIL

APPENDIX 3

TABLE I

McIntyre Porcupine Mines Ltd.

UNDERGROUND MANPOWER

Employment Schedule

Number Required at Beginning of Quarter	1969				1970				1971			
	1	2	3	4	1	2	3	4	1	2	3	4
Superintendents	1	1	2	2	2	3	3	3	3	3	3	3
Overmen Production				1	1	1	2	8	8			
Overmen Dev.	1	2	3	6	6	6	6	6	6			
Assistant Overmen					3	3	6	6	6			
Examiners 1 per shift	2	6	9	17	23	23	25	33	33			
Longwallmen 7 per shift				7	7	7	14	56	56			
C. M. Ops. 5 per shift	10	20	30	50	70	70	70	70	70			
Mechanics	1	2	3	5	7	7	8	10	10			
Electricians	1	2	3	5	7	7	8	10	10			
Mech. Elec.	2	4	6	10	14	14	16	18	18			
Clock fitters				1	1	1	2	8	8			
Beltmen		2	2	6	6	6	8	8	8			
Pumpmen		1	1	2	2	2	2	2	2			
Transport (supplies)		1	2	2	4	6	10	20	20			
Lines				1	1	1	2	2	2			
Installation					6	12	12	24	24			
Datal			2	4	6	8	8	16	16			
Ventilation				1	1	1	1	4	4			
Supervising Mechanics		1	1	3	3	3	3	6	6			
Supervising Electricians		1	1	3	3	3	3	6	6			
Portal Men				3	3	3	3	6	6			
3rd shift Longwall				2	2	2	2	8	8			
Dead shift men				2	2	2	2	4	4			
TOTAL JOBS				133	180	183	216	334	334			
Manpower absenteeism (10%)	1	4	6	13	18	18	22	34	34			
7 day working (+ 30%)				73	99	100	119	184	184			
TOTAL Underground	19	47	71	219	297	301	357	552	552			

Source: Information supplied by McIntyre Porcupine Mines Ltd. to Mr. Selwyn Wass, Division Manager, Canada Manpower Center, Edmonton, and then given to the author.

Table 2
McIntyre Porcupine Mines Ltd.
SURFACE MANPOWER
Employment Schedule

Number required at beginning of quarter	1969				1970			
	1	2	3	4	1	2	3	4
Plank foreman						3	3	3
raw coal							1	2
load out							1	2
dirt disposal							1	2
washing							2	6
maintenance							4	6
absences								2
Sub Total						3	12	23
Shops Welders/burners		1	2	3	3	4	5	6
blacksmiths			1	3	3	4	5	6
machinists			1	3	3	3	3	3
general mechanics	1	2	4	6	7	9	10	11
diesel mechanics		1	2	2	3	3	4	4
pump mechanics			1	1	1	2	2	2
joiners			1	2	2	2	3	3
elec. and rewind		1	1	2	4	6	7	8
cable repair		1	2	2	2	3	3	3
roof supports						2	2	4
Sub Total	1	6	15	24	28	38	44	50
Warehouse		1	1	4	5	5	5	5
Watchman				3	3	3	3	3
General - Trucks day etc.				7	8	9	10	10
Exploration	6	20	20	20	10	10	15	15
Auger or strip mining							6	20
Sub Total	6	21	21	34	26	27	39	53
STAFF Manager	1	1	1	1	1	1	1	1
Product manager	1	1	1	1	1	1	1	1
C. M. E.	1	1	1	1	1	1	1	1
Mechanical Engineer	1	1	1	1	1	1	1	1
Electrical Engineer	1	1	1	1	1	1	1	1
Coal Prep. Engineer	1	1	1	1	1	1	1	1
Chemist	2	2	2	2	2	2	2	2
Business Manager	1	1	1	1	1	1	1	1
Personnel Manager	1	1	1	1	1	1	1	1
Purchasing Agent	1	1	1	1	1	1	1	1
Exploration Man	1	1	1	1	1	1	1	1
Survey	1	1	1	2	2	2	2	2
Plan	2	2	2	2	2	2	2	2
Industrial Engineer			1	1	1	1	2	2
Clerical etc.	2	3	3	3	3	3	3	4
Assistant to Manager	1	1	1	1	1	1	1	1
Sub Total	18	19	20	21	21	21	22	23
Absenteeism 10%				5	5	6	9	14
Workmen only 7 day week (men only +50%)				29	26	30	47	75
TOTAL PAYROLL	25	46	56	113	106	122	173	225

Source: Information supplied by McIntyre Porcupine Mines Ltd. to Mr. Selwyn Wass, Division Manager, Canada Manpower Center, Edmonton, and then given to the author.

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